INSTRUCTIONS FOR MEDICAL OFFICERS TO WHOM A MICROSCOPE IS FURNISHED.

WAR DEPARTMENT,

Surgeon General's Office,

WASHINGTON, *July* 1, 1868.

Medical Officers to whom microscopes are issued from this Office, will be expected to collect material for the Microscopical Section of the Army Medical Museum.

They are not required to contribute mounted slides, although well prepared slides will always be acceptable, and duly credited, but are expected to collect so far as they are able such materials as may prove valuable to the Museum.

Pathological growths of all kinds, whether external or internal, in man or in animals, are especially desired at the Museum for study.

The books describe so many different methods of investigating such growths, that it has been thought advisable to acquaint Medical Officers with the mode found most advantageous at the Museum in preparing specimens for preservation.

The growth having been removed by an operation, or obtained at an autopsy, is to be immediately examined, and its appearance, color, consistence and anatomical relations recorded. Several small portions from the edges, centre, etc., of the growth are to be removed for the purpose of affording thin sections. The cut surface is then scraped, and the juice, diluted if necessary with blood-serum, or a solution of albumen of about the same specific gravity, is examined microscopically. The appearance of the elements thus observed should be recorded by making a camera lucida drawing.

The growth is now to be placed in proof spirit for transmission to the Army Medical Museum. One set of the small portions should also be sent in properly labeled phials of proof spirit to the Museum. A duplicate set should be retained in similar phials for study.

This is required because such small portions placed separately in spirit become more speedily saturated, and thus undergo less alteration than the whole growth does.

If the observer desires to prepare sections of such growths for his own study, he should proceed as follows: the small portions of the growth retained by him for that purpose should remain a few days in proof spirit, and then be transferred to alcohol of 75 per cent. After remaining a few days in this, they should be transferred to absolute alcohol, in which they should remain till hard enough to cut.

The time required varies in accordance with the softness of the specimens from a few hours to a week or more.

After thorough hardening, the pieces may be kept in absolute alcohol for an indefinite period, especially if the alcohol be changed from time to time. The specimens, properly hardened, should be cut by a razor, with or without the aid of any of the ordinary cutting machines. The sections thus cut are stained with carmine by immersing them for a short time in Thiersch's staining fluid, which is prepared as follows: mix one part, by weight, of carmine with one of strong aqua ammonia and three of distilled water for the first solution—the second solution consists of one part of crystalized oxalic acid and twenty-two parts of distilled water. One part of the first solution is to be added to eight of the second, and twelve of absolute alcohol, and then filtered. If the filtrate is orange instead of carmine-red, aqua ammonia is to be added drop by drop until the proper color appears. If crystals of oxalate of ammonia should form they are to be filtered out. The solution is then ready for use.

The precise time of immersion required to stain sections successfully varies from half a minute to several minutes, and must be determined in each case by trial. When the sections have been immersed long enough, they are to be washed with alcohol of 80 per cent., and then soaked in a saturated solution of oxalic acid in 80 per cent. alcohol until the carmine remains only in the nuclei of the tissues. The time required for this varies from a few minutes to half an hour or more.

Trial having determined that the sections are soaked long enough in this fluid, those which are satisfactorily colored are to be washed

in alcohol of 80 per cent. till they are freed from all traces of oxalic acid and then to be transferred to absolute alcohol. They are to remain in this till they have parted with all the moisture obtained during the staining process, which requires from half an hour to an hour. They are then transferred to turpentine, in which they are permitted to float till saturated and should be immediately mounted in Canada balsam, without the use of heat. To effect this a solution of balsam in chloroform is prepared in the following manner: evaporate some balsam over a water bath till it becomes quite solid when cold, then dissolve it in enough chloroform to give the solution about the consistency of cream. Each section is immersed in a drop of this fluid on a glass slide and covered with a thin glass cover. The chloroform speedily evaporating leaves the balsam quite firm. The solution of balsam should be made thin enough to avoid trouble with air bubbles.

Pathological growths may be advantageously injected with some suitable fine injection by those who feel able to do so before employing the above process.

The advantage which this method has been found to possess over the glycerine methods recently employed by many European microscopists is that the preparations are far more permanent, while they are quite as beautiful.

Besides pathological growths, samples of diatomaceous earths and of all other objects of microscopical interest are desired at the Museum.

A copy of Beale's "How to work with the Microscope" will be furnished to each Medical Officer to whom a microscope is issued.

J. K. BARNES,

Surgeon General, U. S. Army.